Toothpick Polyhedrons

Kit contains:

- Toothpicks
- Modeling clay

Note: Unlike playdough, modeling clay must be kneeded before it's pliable and easy to shape. However, once you've, done the work, it's super-awesome for projects.

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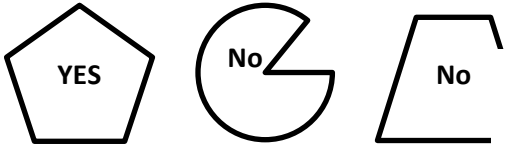
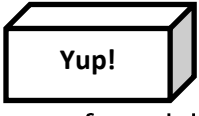
In this activity, you are building polyhedrons (a.k.a., “polyhedra”) out of toothpicks and modeling clay. Before you get started, we need to talk math.

THE MATH!

To get to polyhedrons, we first need to define polygons. What’s a polygon? A **polygon** is a closed flat shape built from line segments.



A **polyhedron** is 3-dimensional solid with many faces, all of which are polygons.



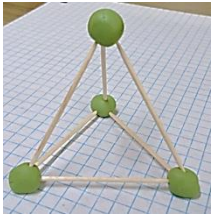
These are the parts of a polyhedron that you should know:

Face: A side of the polyhedron

Vertex: A corner of the polyhedron

Edge: Where the sides meet on a polyhedron

This is a **tetrahedron** built with clay vertices and toothpick edges. Its faces are triangles.



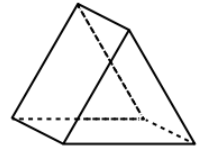
- 4 faces
- 4 vertices
- 6 edges

Don't stop now...

Cube
(all squares)

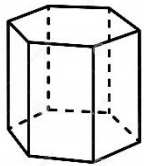
- 6 faces
- 8 vertices
- 12 edges

Triangular Prism
(triangles & rectangles)



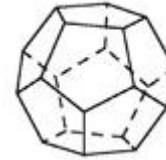
- 5 faces
- 6 vertices
- 9 edges

Hexagonal Prism
(hexagons & rectangles)



- 8 faces
- 12 vertices
- 18 edges

Dodecahedron
(pentagons)



- 12 faces
- 20 vertices
- 30 edges

Mathematician Leonard Euler (1707–1783) discovered a relationship between the faces (F), edges (E), and vertices (V) of a polyhedron. Can you figure it out?

F + V – E = _____